

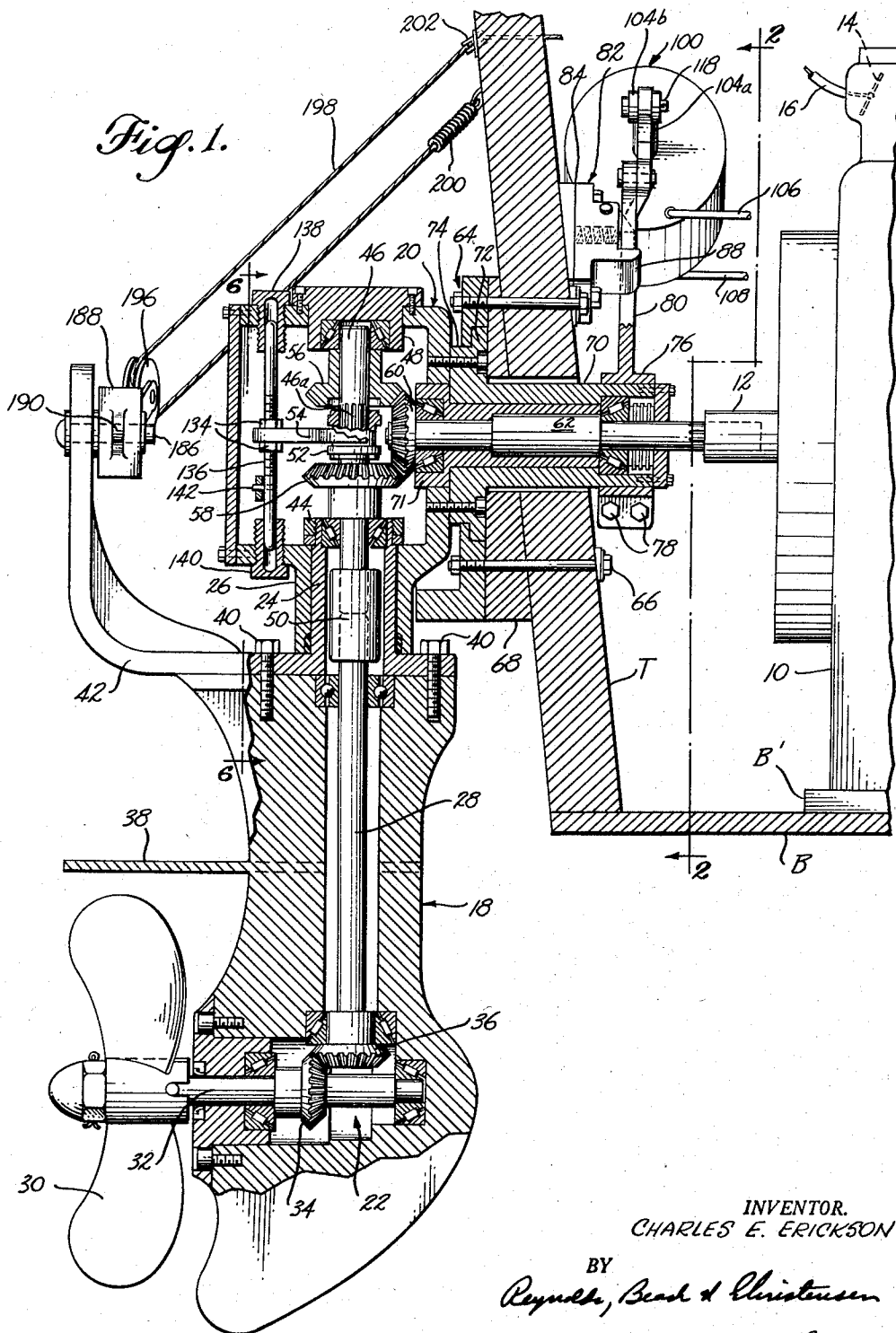
Oct. 13, 1959

C. E. ERICKSON
RETRACTING OUTBOARD PROPULSION AND STEERING
MEANS FOR INBOARD ENGINE BOATS

2,908,243

Filed April 27, 1956

4 Sheets-Sheet 1



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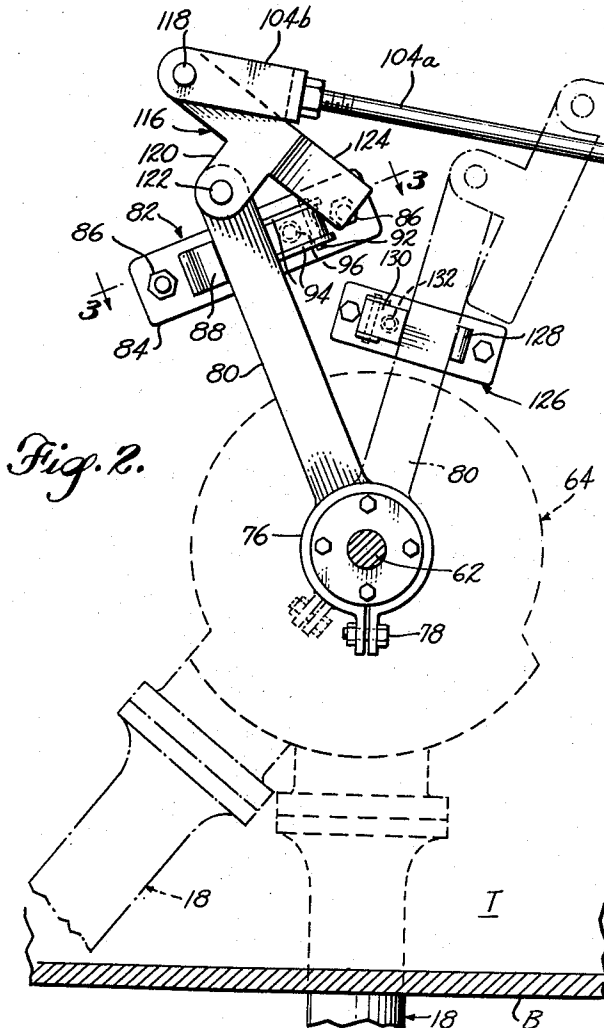
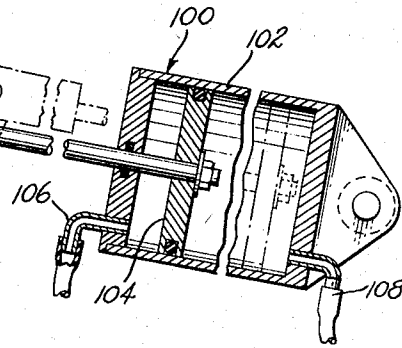
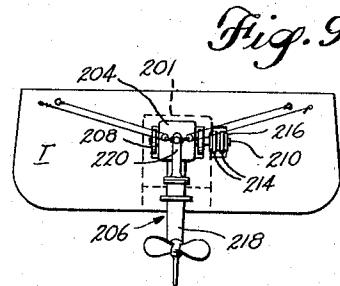
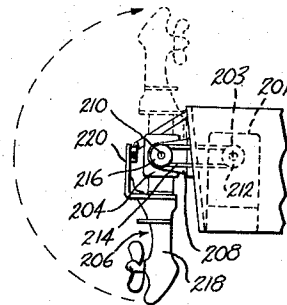
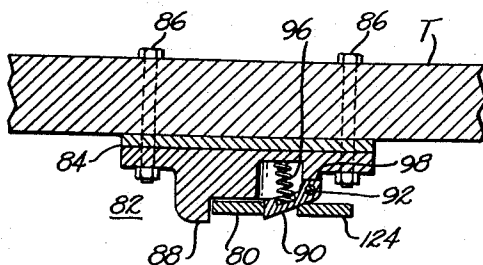


Fig. 3.

Fig. 10.

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Fig. 4.

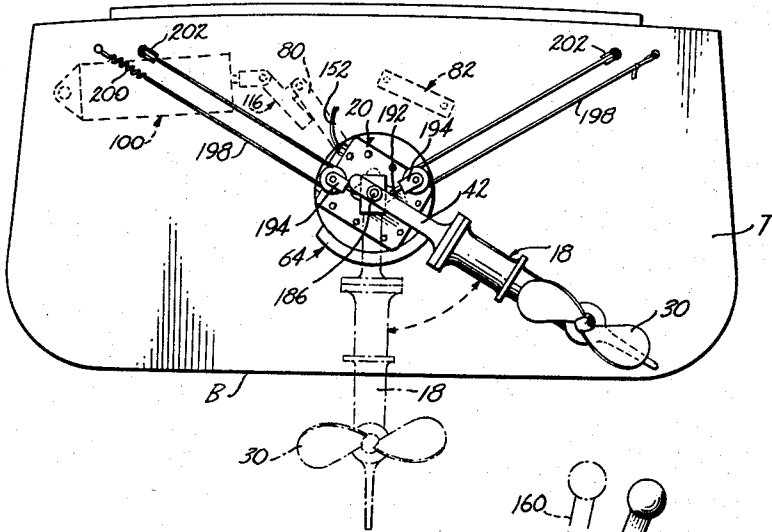


Fig. 7.

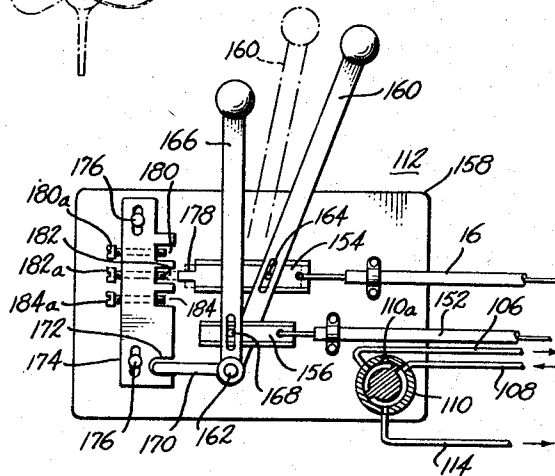
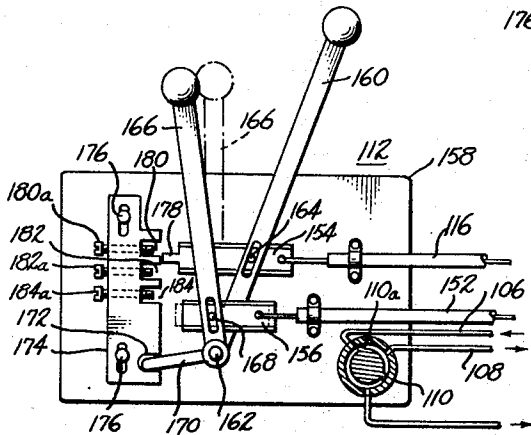


Fig. 8.



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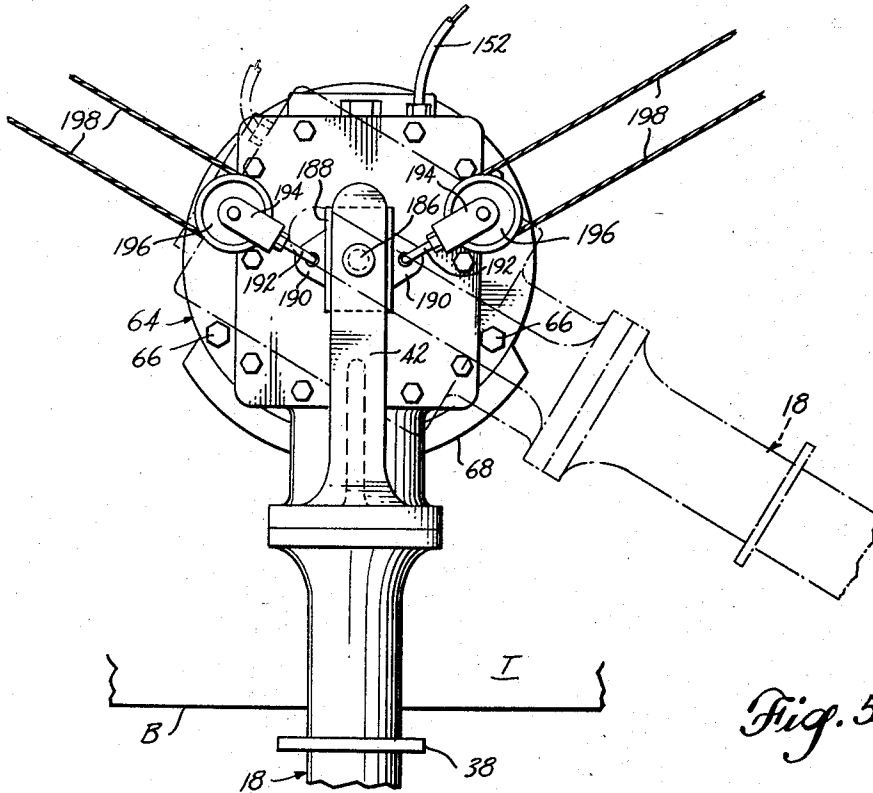


Fig. 5.

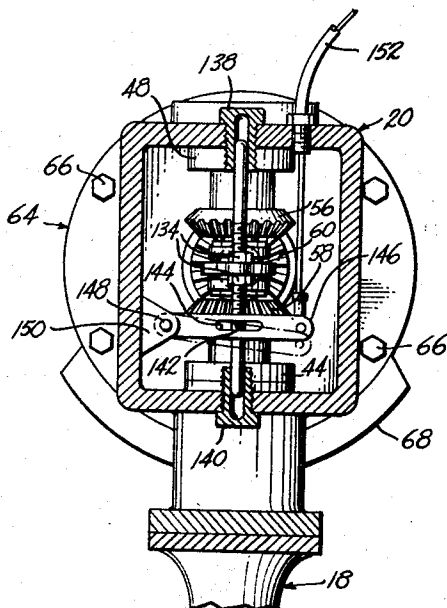


Fig. 6.

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RETRACTING OUTBOARD PROPULSION AND STEERING MEANS FOR INBOARD ENGINE BOATS

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Application April 27, 1956, Serial No. 581,077

17 Claims. (Cl. 115—41)

This invention relates to improvements in propulsion and steering means for boats having inboard engines, and a general object of the invention is to provide such a means which makes possible effectively combining certain advantages of outboard motors, namely portability and versatility, with the comparative quietness, efficiency and reliability afforded by inboard engines. The invention is herein illustratively described by reference to the presently preferred form thereof; however, it will be recognized that certain changes and modifications therein may be made without departing from the essential or characterizing features involved.

A broad object of the invention is to provide certain improvements in transom-mounted retracting outboard propulsion units for inboard engine boats, wherein the unit may be retracted conveniently and by remote control while maintaining both the engine drive connections and the steering connections thereto.

A more specific object is such a unit provided with positioning means holding the same in its normal operating position against displacement forces incident to normal operation thereof, but which means are adapted to slip or yield in order to allow the unit to retract under impact, and thereby avoid breakage in the event of collision with submerged logs or other underwater objects.

Further objects include the provision of such a unit having novel and effective remotely controlled power operated means for moving the same between normal position and retracted position, and remotely controlled steering means.

A more specific object of the invention is the provision of such a unit and control means therefor which is compact, rugged, reliable, convenient to operate and relatively inexpensive to manufacture.

These and other objects together with the novel features and advantages characterizing the invention will become more fully evident from the following description thereof by reference to the accompanying drawings.

Figure 1 is a side view, partly in longitudinal section, of the stern portion of a boat incorporating the novel retracting, outboard propulsion and steering unit connected to an inboard engine and provided with controls for operating the same.

Figure 2 is a transverse sectional view taken on line 2—2 in Figure 1, particularly illustrating the propulsion unit positioning means.

Figure 3 is a sectional detail on line 3—3 in Figure 2.

Figure 4 is a stern view of a boat having the installation.

Figure 5 is an enlarged fragmentary stern view showing the steering means on the unit which permits movement of such unit between normal and retracted positions while maintaining the steering connections thereto.

Figure 6 is a transverse sectional view taken on line 6—6 in Figure 1, illustrating particularly the mechanism for shifting the transmission between forward and reverse drive positions.

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Figure 7 is a simplified side view of remote control apparatus for coordinated engine throttle control and propulsion unit transmission position control, and for remote control of the power operated means for moving the unit between retracted and normal positions.

Figure 8 is a view similar to Figure 7 with the control elements in different settings.

Figure 9 is a stern view of a boat incorporating a modified and less preferred retracting outboard propulsion unit.

Figure 10 is a side view of the stern portion of the boat incorporating the modified unit, shown by solid lines in its normal position and by broken lines in its fully retracted position.

Referring to Figures 1 to 9, inclusive, the boat may be assumed to be of conventional construction having the usual stern transom T forming a part of the hull. The boat bottom B, joined to the transom, is provided with suitable stiffener means B' to support the inboard engine 10 at a generally central location near the transom and with the engine output drive shaft 12 extending longitudinally of the boat on a horizontal axis, as shown. The inboard engine has the usual controls including the throttle member 14 adapted to be adjustably positioned by the Bowden wire 16 connected thereto and operated from a remote location by means to be described.

The engine 10 is preferably of the separately lubricated four-cycle type, although the invention is not limited in scope to the particular form of inboard engine employed.

The retracting outboard propulsion and steering unit to which the engine 10 is drivingly connected comprises the elongated propeller support and drive housing 18 which in form preferably resembles the lower propeller support and drive housing structure employed in modern-day efficient outboard motors. This support and housing means comprises an upper section, including the gear case 20, and a lower section including the propeller support and drive assembly 22. The lower section has a sleeve 24 on its upper end which fits rotatably within a sleeve 26 projecting downwardly from the upper section so as to permit rotation of the lower section relative to the upper section about the longitudinal normally vertical axis thereof. This axis is concentric to the vertical transmission shaft 28 which extends lengthwise through the housing means 18.

A propeller 30 is mounted on a shaft 32 in suitable bearings in the lower end of the support and housing means 18 and is driven by a bevel gear 34 fixed on the horizontal shaft 32 and meshing with a bevel gear 36 fixed on the lower end of the vertical transmission shaft 28. Suitable seals and packing elements are provided to make the propeller support and drive assembly 22 completely waterproof within its housing. A horizontal deflector plate 38 is mounted on the support and housing means 18 above the propeller 30.

The sleeve 24 comprises part of a fitting which is secured by bolts 40 to the remainder of the lower section of the support and drive housing 18. Such fitting includes a rearwardly and upwardly projecting bracket 42 serving a purpose later to be described in connection with the steering arrangement for the unit. The upper end of the sleeve 24 carries a stop nut 44 threaded thereon to hold the sleeve against retraction downwardly from the surrounding collar 26. A countershaft 46, aligned with the transmission shaft 28, is journaled in bearings mounted in the upper end of the sleeve 24 and in the plug 48 bolted to the top of the gear case 20, as shown. A splined sleeve 50 rotatively interconnects the abutting ends of the shafts 28 and 46 for producing conjoint rotation thereof while permitting endwise separation of the shafts

when the bolts 40 are removed for withdrawing the bottom portion of the support and housing means 18.

The transmission employed in the unit is of the reversible type having a neutral position and forward and reverse drive positions. For this purpose the countershaft 46 has a splined central portion 46a engaged by the drive reversing element or collar 52 having splines slidably engaging those of the shaft. This collar rotates with the shaft and is free to slide lengthwise thereof under control of the gear shift yoke 54 embracing the reduced central section of the collar, as shown in Figures 1 and 6. A bevel gear 56 is mounted to rotate freely on the upper part of shaft 46 and another bevel gear 58 is similarly mounted on the lower portion of the shaft 46. These bevel gears are adapted to be drivingly engaged by the respectively adjacent ends of the drive reversing collar 52. The two bevel gears 56 and 58 mesh continuously with a third bevel gear 60 mounted on the drive shaft 62 which projects forwardly from the gear case 20 in alignment with the engine output shaft 12, and is connected to the latter for drive purposes. Thus the two bevel gears are rotated in relatively opposite directions and by shifting the reversing collar 46a up or down from its intermediate or neutral position into engagement with one or the other of the bevel gears 56 or 58 the propeller 30 may be driven in either the forward or reverse-drive sense.

The support and housing means 18 is mounted by its upper section, namely by the gear case 20, on a mounting base 64. The mounting arrangement is such that the unit is permitted to swing about an axis coincident with the axis of drive shafts 62 and 12. The mounting base 64 comprises an annular member secured by bolts 66 to the stern side of the transom T at a relative angle which disposes it in a substantially vertical plane with the boat trimmed and under way. Suitable shim means 68 may be provided for that purpose, if necessary, depending upon the angle of the transom in relation to the longitudinal axis of the boat. Of course, the plane of the annular mounting base 64 must be perpendicular to the common axis of the shafts 12 and 62.

The gear case 20 has a forwardly projecting sleeve portion 70 rigidly mounted thereon, which is rotatably received within and is supported by the annular mounting base 64. To this end the sleeve portion 70 has a base flange 72 which is reduced in diameter at 74 adjacent the forward face of the gear case 20 in order to accommodate a step in the diameter of the inside rim of the annular mounting base 64. The latter serves as a support or journal for the annular base of the sleeve portion 70 and maintains its flange 72 in slidable contact with the outside face of the shim means 68. The specific details of this mounting arrangement may vary as long as the unit is journaled to swing about the common axis of shafts 12 and 62. The flange portion 70 projects forwardly through a hole in the transom T and carries internal bearings and an internal journal sleeve 71 for the drive shaft 62 which extends forwardly through it to the shaft 12.

The positioning means for the retractable outboard propulsion unit comprises the split clamp band 76 tightened around the forwardly projecting end of the sleeve portion 70 by bolts 78 in order to frictionally grip such sleeve portion and hold the same against rotation by normal operating forces exerted thereon by the propulsion unit. However, the frictional grip permits the sleeve portion 70 to rotate within the clamp band in response to impact forces applied to the propulsion unit generally in a direction to swing the same about the common axis of the shafts 62 and 12. A lever arm 80 rigid with the clamp band 76 projects radially therefrom, and in the normal or operating position of the propulsion unit is engaged and held in fixed position by a detent device 82. This detent device comprises a base 84 mounted preferably on the forward side of the boat transom T by bolts

86. A boss 88 projects forwardly from this base and serves as a rigid stop engaging one edge of the lever arm 80 in its normal position. The opposite edge of the lever arm is engaged and held (Figure 3) by a retractable spring-actuated latch 90 mounted on a pivot pin 92 between two flanges 94 projecting in parallel relationship from the front side of the detent base. A spring 96 socketed in a recess in the detent base acts outwardly on the latch to hold the same in its extended position, which position is established by contact between a flat surface 98 on the latch and an underlying abutment surface on the base 84, as shown in Figure 3. Thus, the lever arm 80 is trapped normally between the shoulder of the boss 88 and the adjacent end portion of the latch 90.

For purposes of moving the lever arm 80 in order to swing the outboard propulsion unit between normal and retracted positions, a vacuum operated jack 100 is provided, having a cylinder member 102 and a piston member 104, including a piston rod 104a provided with a coupling yoke 104b on its free end. The piston rod is connected to lever 80 for swinging the same back and forth by extension and retraction of the jack. The cylinder has conduits 106 and 108 connected to its respective opposite end portions for application of suction and introduction of atmospheric air alternatively thereto under control of the four-way valve 110. The latter is mounted on the remote control panel 112 as shown in Figures 7 and 8. A vacuum tube 114 is connected between the common port of the valve 110 and the carburetor manifold (not shown) of the engine 10 for applying suction to the end of the jack cylinder 102 which is connected to the conduit 114 by the valve 110. A port 110a in the valve wall communicates with the atmosphere to permit air under atmospheric pressure to enter the end of the jack cylinder opposite that which is at any instant subjected to the suction of the engine manifold. It is found that with a pneumatic jack of this type so operated, ample force is readily developed to move the outboard propulsion unit between its two positions as desired with components of relatively compact form and arrangement.

The piston rod yoke 104b is connected to the lever arm 80 by a T-shaped link 116, one end of which is connected by a pivot 118 to the yoke. The intermediate arm 120 of the T-shaped link is connected by a pivot 122 to the outer end of the lever arm 80. The third arm 124 projects therefrom in relatively offset relationship so as to serve as an actuating element for the latch 90 and to swing into abutment with the edge of lever 80. Thus when the valve 110 is positioned to subject the jack cylinder 102 to differential pressures in a sense to draw the lever arm from its solid-line position toward its broken-line position in Figure 2 there is an initial lost motion executed by the piston member and the link 116, during which the link swings from its solid-line position toward its broken-line position. In so doing, the link arm 124 depresses the latch 90 (Figure 3), then comes into limiting abutment with the adjacent side of the lever arm 80. When such latter abutment takes place, the link 116 becomes an effective part of the lever arm, whereby further retraction movement of the piston member draws the lever arm toward its broken-line position as shown in Figure 2. This retracts the outboard propulsion unit so as to swing the lower end thereof into retracted position preferably above the boat hull bottom, as shown in Figure 4.

A manually released detent 126 may be provided, mounted on the transom, to engage the lever arm and hold it in its displaced position corresponding to the retracted position of the propulsion unit, as shown in Figure 2. The detent 126 includes a fixed abutment element 128 and a spring-actuated, but retractable abutment element 130, urged outwardly by a spring 132 much in the manner of the spring-actuated latch 90 in Figure 3.

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In order to move the outboard propulsion unit from its retracted position to its normal position, the four-way valve 110 is positioned to establish differential pressures in the jack cylinder 102 for advancing the piston rod 104a from its broken-line position toward its solid-line position shown in Figure 2. During the initial portion of this movement the link 116 swings relative to the lever arm 80 and to the piston rod yoke 104b, until the base of the yoke is abutted by the edge of the link in the relationship shown by solid lines in Figure 2. Thereupon further extension movement of the piston member swings the lever arm toward its solid-line position wherein it passes the latch 90 to become engaged and held thereby.

As previously mentioned, shifting of gears between the forward and reverse drive positions of the transmission unit is effected by movement of the shifting element or collar 46a up or down in the gear case 20 by the action of the yoke 54. Such yoke is secured between lock nuts 134 on the threaded portion of a shifting rod 136 slidably retained in recessed plugs 138 and 140 respectively threaded in the top and bottom walls of the gear case 20. This rod has a pin 142 which projects laterally from the rod into an elongated slot 144 formed in an operating lever 146. The lever is mounted at one end by a pin 148 on brackets 150 to swing about a horizontal axis parallel to the common axis of shafts 12 and 62 in order to shift the rod 136 up or down. The tube of a Bowden wire 152 is secured to the gear case 20 and the wire itself is connected to the swinging end of the lever 146, as shown in Figure 6. The Bowden wire extends to the control panel 112.

At the control panel 112 the engine control Bowden wire 116 is connected to a sliding control element 154, and the Bowden wire 152 is connected to a sliding control element 156. These two control elements are slidably received between parallel guides on the support plate 158 of the control panel. The sliding control element 154 is actuated along its guides by a lever 160 pivoted at 162 and connected to the element 154 by a slot-and-pin connection 164. The control element 156 is similarly actuated by a lever 166 mounted on the same pivot 162 and connected to such control element by a slot-in-pin connection 168.

Control of the engine throttle and shifting elements is coordinated so as to avoid possible transmission damage due to shifting of gears with the engine operating at excessively high speed or due to operating the engine at excessive speeds with the transmission out of neutral but not fully in either drive position. For this purpose the lower or pivoted end of the lever 166 has an arm 170 projecting laterally therefrom into a notch 172 formed in the edge of a slide plate 174 guided by the slot-and-pin guides 176 to move lengthwise of itself in a direction perpendicular to the direction of movement of the control elements 154 and 156. The end of the control element 154 adjacent the slide plate 174 has a longitudinal projection 178 adapted to enter any one of three notches 180, 182 and 184 formed in successive arrangement in the adjacent edge of the slide plate 174. These notches are so positioned along the length of the slide plate 174 that the intermediate notch 182 is aligned with and engageable by the projection 178 when the lever arm 166 is in the neutral position. The notch 180 is aligned with and engageable by the projection 178 when the lever 166 is in one of the drive positions, and the notch 184 is aligned with and engageable by such projection when such lever is in the other drive position.

The projection 178 enters one or the other of these notches only as the speed control lever 160 is advanced toward the higher speed settings. When the control element 154 is in a high speed setting, causing the engine to operate at high speed, and the projection 178 is re-

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ceived in one of the notches, the slide plate 174 is then locked against movement and is thereby effective to lock the lever 166 against movement so as to prevent shifting of gears. This result is, of course, due to the fact that the projections formed between the notches in plate 174 about one side or the other of the projection 178 received in any such notch. Likewise, the presence of these projections between the notches 180, 182 and 184, prevents the speed control lever 160 from being advanced to a high speed setting when the shifting collar 46a is only partly advanced from neutral toward a definite drive position, since the tip of projection 178 abuts the ends of the projections on plate 174 between the notches and prevents advance of the speed control lever. This interlock feature provided by the transversely movable notched plate 174 prevents damage to the transmission. Stop screws 180a, 182a and 184a project into the bases of the correspondingly numbered notches by adjustable amounts in order to establish the permissible depth of penetration into such notches of the projection 178.

In Figure 7 the speed control lever 160 is retracted to a low speed setting and it is possible to shift gears by movement of the lever 166. In Figure 8 the shifting lever 166 is in an intermediate position wherein the transmission is neither in neutral nor in a definite drive setting, and it is now impossible to advance the speed control lever 160 to a high-speed setting because of the abutment between the projection 178 and the projection on the slide plate 174 between the notches 180 and 182.

In order to steer the boat the lower section of the propeller support and drive housing means 18 is rotatable about a vertical axis relative to the upper section thereof, as previously mentioned. For this purpose the lower section has a rearwardly and upwardly projecting bracket 42. This bracket carries a pin 186 which is substantially aligned with the common axis of the shafts 12 and 62 and which pivotally supports the block 188 thereon to revolve about such axis. The block has apertured ears 190 on opposite sides thereof disposed in a vertical plane which are loosely engaged by loops 192 carried in a horizontal plane by the yokes 194 of pulleys 196. Steering control cables 198 extend around these pulleys from take-up springs 200 anchored to the rear side of the transom, to a steering wheel (not shown), by way of suitable guides such as the pulleys 202. The cables wrap around the steering wheel drum oppositely in the usual manner so that turning of the wheel draws in one cable while unreeling the other. This action causes the propulsion unit lower section to be turned for steering purposes. A novel feature of the disclosed arrangement including the pulley block 188 pivoted on an axis common to the shafts 12 and 62 is that with the arm 42 in central or straight-ahead position the arrangement permits retraction of the propulsion unit without disturbing the steering connections or even appreciably rotating the steering wheel of the boat. Retraction is also permitted in other positions of the arm 42, although steering cable tension may vary accompanied by limited turning of the steering wheel, the amounts depending upon the position of the arm at the time, yet such amounts will be minimum with the chosen location of pivot pin 186 in normal alignment with the tilt-up axis of the unit. Offset of the axis of pin 186 with respect to the shafts 12 and 62 may be permitted, but has the effect of causing the steering wheel of the boat to be rotated accompanying movement of the propulsion unit between its retracted and normal positions even with the arm 42 in its centered position. Preferably, therefore, the pulley block 188 is normally pivoted on an axis substantially in the vicinity of the common axis of shafts 12 and 62, and desirably is aligned therewith.

When in storage or in transit, or when the boat is beached, the outboard propulsion unit is secured in its retracted position by the manually releasable detent 126 (Figure 2). In this position, as shown by solid lines in

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Figure 4, the retracted unit is protected against damage and against interference with handling or movement of the boat. In order to move the unit to its normal or operating position as shown by dotted lines in Figure 4 and as shown in Figure 1, the detent latch 130 is manually (or otherwise) released, and the unit is either drawn down by manual force, with the valve 110 properly positioned to permit such movement, or the engine is started and negative pressure is applied to the appropriate side of the piston member 104, as by positioning the valve as in Figure 8, in order to forcibly lower the unit. When the unit reaches its normal or lowered operating position, the lever arm 80 passes over the spring-actuated latch 90 and is thus locked in place by the detent 82. The frictional grip between the clamp member 76 and the sleeve portion 70 is adequate to hold the unit in this normal position against normal operating forces. However, should the unit strike a submerged log or other underwater object obliquely, as is normally the case with most impacts, slippage taking place between the clamp member 76 and sleeve portion 70 permits the unit to be swung upwardly and thus avoid damage thereto. With the unit in its normal operating position, manipulation of the interlock-controlled levers 160 and 166 controls engine speed and drive position of the transmission.

It will be noted that by rigidly mounting the unit so that it can only pivot about a longitudinal axis of the boat, shifting of gears does not cause the unit to be swung forward or backward due to sudden application of propeller force as happens with conventional outboard motors. Moreover, no interlock is necessary to hold the propulsion unit down when the unit is placed in reverse gear, as is customarily required in the case of an outboard motor so as to prevent the motor from "climbing up" when speed is increased in reverse gear setting.

In the modification shown in Figures 9 and 10 the inboard engine 201 is mounted with its drive shaft 203 extending athwartships. The upper section 204 of the propeller support and drive housing 206 is carried by a mounting base 208 secured on the back side of the transom to permit such support and housing to pivot about a transverse axis 210 parallel to the engine shaft 203. A pulley 212 mounted on the engine shaft is encircled by belts 214 driving the pulley 216 comprising part of the drive means for the propulsion unit. The driven pulley 216 is mounted on a drive shaft concentric with the axis 210. For steering purposes, the lower section 218 of the support and housing means 206 is connected to the upper section 204, as in a manner similar to the preceding embodiment, by means permitting it to pivot about the longitudinal, vertical axis of the unit. A bracket 220 projecting rearwardly and upwardly from the lower section 218 is provided for steering purposes as in previous form of the invention.

In this modified form of the invention it is preferred that the unit be mounted to swing from its normal position to a retracted position in which it extends directly upwardly as shown by dotted lines in Figure 10. In this way the retracted unit does not project unduly rearwardly from the boat and present an unnecessary obstruction to convenient handling and transporting of the boat as do conventional outboard motors in retracted position.

I claim as my invention:

1. In combination, a boat having an inboard engine and having a stern transom, and a retracting outboard propulsion unit driven by said engine, said unit comprising a mounting base adapted to be fixedly mounted on the exterior face of the boat transom, elongated propeller support and drive housing means having normally upper and lower sections interconnected by means permitting rotation of the lower section relative to the upper section about the longitudinal axis of said means, a propeller rotatively mounted on the lower section of said means, propeller drive means extending through said support and housing means from the upper section thereof to said

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propeller, said drive means including a transmission shaft extending coaxially within said support and housing means, said drive means further including a drive member mounted in the upper section of said support and housing means for rotation therein about an axis extending generally longitudinally of the boat and transversely to the length of said support and housing means, said drive member being connected to the boat engine for rotation thereby, means coaxial with said drive member pivotally mounting said support and housing means by the upper section thereof on said mounting base to permit swinging of said latter means relative to said base about said longitudinal boat axis between normal position of said latter means projecting downwardly from said base to dispose said propeller in its operative position, and upraised retracted position of said latter means disposing the propeller materially above its operative position, steering means on said lower section adapted for turning of the same about said longitudinal support and housing means axis for steering the boat, said steering means comprising a rigid member fixed to the lower section of the support and housing means to project generally rearwardly therefrom, and a pivoted member connected to the projecting end of said rigid member to pivot thereon about an axis in the vicinity of and parallel to the axis of swing of said support and housing means, and remotely controlled steering mechanism on the boat connected to said pivoted member on opposite sides thereof to turn said support and housing means lower section in either direction, said support and housing means being swingable into its retracted position while maintaining said steering means connection and said engine drive connection.

2. The combination defined in claim 1, and retracting means connected to the support and housing means and operable to swing the support and housing means from its normal position to its retracted position, said retracting means including a slip coupling permitting of such swinging independently of operation of said retracting means in response to extraordinary force applied transversely to the lower section of said support and housing means.

3. The combination defined in claim 2 wherein the retracting means comprises remotely controlled power operated means operable to effect such swinging, detent means cooperating with said power operated means to hold said support and housing means in its normal position, said detent means including an element actuatable for releasing the same, said power operated means including lost motion means in the connection thereof to the support and housing means and operable to actuate said detent means element for release of said detent means during initial operation of said power operated means, and preliminary to final operation thereof, in the sense to retract said support and housing means thereby.

4. A retracting outboard propulsion unit for a boat having an inboard engine and having a stern transom, said unit comprising a mounting base adapted to be fixedly mounted on the exterior face of the boat transom, elongated propeller support and drive housing means having normally upper and lower sections interconnected by means permitting rotation of the lower section relative to the upper section about the longitudinal axis of said means, a propeller rotatively mounted on the lower section of said means, propeller drive means extending through said support and housing means from the upper section thereof to said propeller, said drive means including a transmission shaft extending coaxially within said support and housing means, said drive means further including a drive member mounted in the upper section of said support and housing means for rotation therein about a generally horizontal axis disposed transversely to the length of said support and housing means, said drive member being adapted for connection to the boat engine for rotation thereby, means coaxial with said drive member pivotally mounting said support and housing

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means by the upper section thereof on said mounting base to permit swinging of said latter means relative to said base about said horizontal axis between normal position of said latter means projecting downwardly from said base to dispose said propeller in its operative position, and upraised retracted position of said latter means disposing the propeller materially above its operative position, and steering means on said lower section adapted for turning of the same about said longitudinal support and housing means axis for steering the boat, said steering means comprising a rigid member fixed to the lower section of the support and housing means to project generally rearwardly therefrom, and a pivoted member connected to the projecting end of said rigid member to pivot thereon about an axis substantially coincident with the axis of swing of said support and housing means, said pivoted member being adapted for connection to remote control steering mechanism on the boat.

5. A retracting outboard propulsion unit for a boat having an inboard engine and having a stern transom, said unit comprising a mounting base adapted to be fixedly mounted on the exterior face of the boat transom, elongated propeller support and drive housing means having normally upper and lower sections interconnected by means permitting rotation of the lower section relative to the upper section about the longitudinal axis of said means, a propeller rotatively mounted on the lower section of said means, propeller drive means extending through said support and housing means from the upper section thereof to said propeller, said drive means including a transmission shaft extending coaxially within said support and housing means, said drive means further including a drive member mounted in the upper section of said support and housing means for rotation therein about a generally horizontal axis disposed transversely to the length of said support and housing means, said drive member being adapted for connection to the boat engine for rotation thereby, means coaxial with said drive member pivotally mounting said support and housing means by the upper section thereof on said mounting base to permit swinging of the latter means relative to said base about said horizontal axis between normal position of said latter means projecting downwardly from said base to dispose said propeller in its operative position, and upraised retracted position of said latter means disposing the propeller materially above its operative position, and steering means on said lower section adapted for turning of the same about said longitudinal support and housing means axis for steering the boat, said steering means comprising a rigid member fixed to the lower section of the support and housing means to project generally rearwardly therefrom, and a pivoted member connected to the projecting end of said rigid member to pivot thereon about an axis in the vicinity of and parallel to the axis of swing of said support and housing means, said pivoted member being adapted for connection to remote control steering mechanism on the boat.

6. In combination, a retracting outboard propulsion unit having a lower end portion including propeller means, an upper end portion, and means on the upper end portion adapted for pivotally mounting the unit on a boat transom in a normal depending operative position while permitting upward tilting of said unit into retracted position with the propeller relatively elevated above its normal position, power operated means operatively connected to said unit and adapted to move the same between positions, and detent means cooperating with said power operated means to hold said unit in its normal position, said detent means including an element actuatable for releasing the same, said power operated means including means in the connection thereof to said unit and operable to actuate said detent means element for release of said detent means in response to initiation of movement of said power operated means in the direction to retract the unit, thereby to release said unit to permit effecting retraction thereof

by further movement of said power operated means in the same direction.

7. The combination defined in claim 6, adapted for operation in conjunction with boat engines having a vacuum manifold, wherein the power operated means comprises a vacuum jack operatively connected to the unit and adapted to be powered by the manifold vacuum of a boat engine, and remote control means adapted for controlling application of vacuum pressure to said jack.

8. The combination defined in claim 6, wherein the unit comprises an annular surface coaxial with the tilt axis of the unit, and the connection of the power operated means to the unit further comprises a clamp member encircling and frictionally engaging said annular surface and adapted to be rotated about said axis by operation of said power operated means, thereby to tilt the unit, said clamp member being held by the detent means against rotation with the unit in its operative position and when so held being adapted by friction to hold said unit in its operative position against normal operating forces tending to displace the same therefrom, but to slip relative to said annular surface in response to extraordinary forces tending to produce retraction of said unit.

9. The combination defined in claim 6, and yieldable coupling means interposed in the connection of the power operated means to the unit and including a coupling element normally held by the detent means in a fixed position, thereby to maintain the unit in its normal operative position against the normal operating forces tending to displace the same from such normal position, while being adapted to yield to permit upward tilting of the unit, independently of the power operated means, in reaction to extraordinary forces tending to produce retraction of such unit.

10. A retracting outboard propulsion unit for a boat having an inboard engine and having a stern transom, said unit comprising a mounting base adapted to be fixedly mounted on the exterior face of the boat transom, elongated propeller support and drive housing means having normally upper and lower ends, a propeller rotatively mounted on the lower end of said means, propeller drive means extending through said support and housing means from the upper end thereof to said propeller, said drive means including a drive member mounted in the upper end of said support and housing means for rotation therein about an axis extending generally longitudinally of the boat transversely to the length of said support and housing means, said drive member being adapted for connection to the boat engine for rotation thereby, means coaxial with said drive member pivotally mounting said support and housing means by the upper end thereof on said mounting base to permit swinging of said latter means relative to said base about said axis between normal position of said latter means projecting downwardly from said base to dispose said propeller in its operative position, and upraised retracted position of said latter means disposing the propeller materially above its operative position, and power operated means connected to the normally upper end of the support and housing means for swinging the same between its normal and retracted positions, detent means cooperating with said power operated means to hold said support and housing means in its normal position, said detent means including an element actuatable for releasing the same, said power operated means including lost motion means in the connection thereof to the support and housing means and operable to actuate said detent means element for release of said detent means during initial operation of said power operated means, and preliminary to final operation thereof, in the sense to retract said support and housing means thereby.

11. In combination, a retracting outboard propulsion unit having a lower end portion including propeller means, an upper end portion, and means on the upper

end portion adapted for pivotally mounting the unit on a boat transom in a normal depending operative position while permitting upward tilting of said unit into retracted position with the propeller relatively elevated above its normal position, a lever arm on the unit for tilting the same, power operated means operatively connected to said unit through the lever arm and adapted to move the same between positions, said power operated means comprising a fluid-operated jack comprising cooperating cylinder and piston members, one such member being connected to the lever arm and the other such member being adapted for connection to the boat, and means for conducting operating fluid to and from said cylinder member, and detent means cooperating with said power operated means to hold said unit in its normal position, said detent means including an element actuatable for releasing the same, and means in the connection thereof to said unit and operable to actuate said detent means element for releasing of said detent means in response to initiation of movement of said power operated means in the direction to retract the unit, thereby to release said unit to permit effecting retraction thereof by further movement of said power operated means in the same direction.

12. The combination defined in claim 11, wherein the detent means element normally engages and holds the lever arm in the position thereof corresponding to the normal operating position of the unit, and wherein the means operable to actuate the detent means comprises a link member pivotally interconnecting the first jack member and the lever arm and swingable relative to both between predetermined limits relative thereto, said link member having a portion disposed to actuate said detent means element to release said detent means and thereby the lever arm accompanying initial swinging of said link member during operation of the jack in the sense to raise said unit to its retracted position.

13. A retracting outboard propulsion unit for a boat having a stern transom, said unit comprising a mounting base adapted to be mounted on the exterior face of the boat transom, elongated propeller support and drive housing means having normally upper and lower ends, a propeller rotatively mounted on the lower end of said means, propeller drive means extending through said means from the upper end thereof to said propeller, means pivotally mounting said support and drive housing means by the upper end thereof on said mounting base to pivot on said base about an axis parallel to the longitudinal axis of the boat, thereby to permit transverse swinging of said support and housing means relative to said base about said axis between normal position of said latter means projecting downwardly from said base to dispose said propeller in its operative position, and upraised retracted position thereof disposing the propeller materially above its operative position, and releasable means normally holding said support and housing means in its normal position, said releasable means including slip coupling means permitting forcible retraction movement of said support and housing means about said axis by extraordinary force applied thereto while holding such latter means against retraction movement under normal operating forces applied thereto.

14. The unit defined in claim 13, wherein the releasable means comprises an annular member mounted on the upper end of the support and housing means coaxial with the latter's pivot axis, an annular friction member frictionally engaging said annular member, and positioning means adapted for holding the friction member in predetermined position.

15. The unit defined in claim 14, wherein the positioning means comprises a fluid-operated jack, an operating connection between said jack and said friction member to permit rotation thereof by operation of said jack, thereby to raise and lower the support and drive housing means, detent means engageable to hold the friction member in a position corresponding to the operative position of the unit, and means to release said detent, said release means being arranged for actuation by initial movement of the jack in the direction to effect retraction of the unit.

16. The unit defined in claim 13, wherein the support and housing means comprises upper and lower sections interconnected by means permitting rotation of the lower section relative to the upper section about the longitudinal axis of said support and housing means, and steering means on said lower section adapted for turning of the same about the latter axis for steering the boat, said steering means comprising a rigid member fixed to the lower section, and a turnable member connected to said rigid member and adapted to turn with relation thereto about the axis of swing of the support and housing means during retraction of the latter, and remotely controlled steering mechanism operatively connected to said rigid member through said turnable member to effect steering of the boat by turning of said lower section.

17. The unit defined in claim 16, and retracting means connected to the support and housing means through the releasable means, said retracting means comprising remotely controlled power operated means operable to effect such swinging, detent means cooperating with said power operated means to hold said support and housing means in its normal position, said detent means including an element actuatable for releasing the same, said power operated means including lost motion means in the connection thereof to the support and housing means and operable to actuate said detent means element for release of said detent means during initial operation of said power operated means, and preliminary to final operation thereof, in the sense to retract said support and housing means thereby.

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